DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AERONAUTICAL SYSTEMS CENTER (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO

21 JUN 1999

MEMORANDUM FOR DISTRIBUTION

FROM: ASC/GR

SUBJECT: C-37 QOT&E Final Report DRs

1. The C-37A Commercial Aircraft IPT has received and studied the "C-37A (C-137 Replacement) Qualification Operational Test and Evaluation Final Report, March 1999". The team has conducted and completed assessments of possible courses of action to address the group prioritized DRs. This memo reports our selected course of action to correct concerns with the effectiveness and suitability of the C-37A for the SAM mission.

2. In addressing the identified deficiencies, it is notable to report the C-37A compares exceptionally well with other mobility aircraft. For example, the, "C-17 IOT&E Final Report," documented 2,233 DRs. In fact, to the knowledge of the undersigned, there has been no aircraft in the Air Force inventory so well focused as the C-37A on the operational effectiveness and users needs. This is attributed to the integration and participation of the users in the Integrated Product Team from the beginning of the IPPD based missionization process.

3. For ease of reference, Table 7, Group Prioritized DR List, from your Final Report, is incorporated in an attachment to this letter with DR priority ranking appended. In addition, a column with current status has been added. Of the 30 Deficiency Reports, all but 3 of the following have been corrected to date (see attached):

a. DR Ranked 1: RVSM certification is scheduled for 31 March 2000. The RVSM Project Engineer at Gulfstream has supplied the following information: Currently the Static Source Error Correction (SSEC) curves are being revised based upon the G-V operators that are participating in the height monitoring efforts. A meeting with the FAA is planned next month for approval of the technical approach. Upon approval, the pitot probe mount modification Aircraft Service Change (ASC) will be finalized and assigned a number. The new ASC will likely be approved by the end of September; and will also include pull, replace, and software upgrade of the MADCs to --612. Then a new phase of data gathering and statistical analysis will begin based upon the new SSEC software. By the EOY, the information will be reported to the FAA for final G-V fleetwide certification. Final certification approval is desired by the end of the first quarter of 2000. Following this, the ASC will be released with the final approved modifications.

b. DR Ranked 15: Data transfer (e-mail) via SARS. SARS and TARS data transfer rates are infrastructure related and are limited by ground-stations and satellites owned by GTE, INMARSAT, and COMSAT. These multinational corporations understand the need to upgrade the capacity of their global networks, and are in the process of upgrading the enormous infrastructure. The DISA Executive Management Board, Senior Leadership Travel Communications System Operations Working Group (EMB SLTCS-OWG) is currently investigating what can be done to encourage these MNC service providers to accelerate the bandwidth.

c. DR Ranked 19: Stowable cabin tables. Rigidity is the issue, since the tabletops demonstrate some flexure under loads. Gulfstream was contacted to prepare a proposal, to add to the Acquisition Contract, to modify the tables to make them sturdier. The company responded back that due to back orders, and engineering losses, they cannot respond to this concern at the present time. The entire G-V fleet has tables of similar construction and many customers are pushing to firm up the table supports.

4. It is also emcumbent upon the IPT to address concerns expressed by the top level Critical Operational Issues (COI), Measures of Effectiveness (MOE), and Measures of Performance (MOP) evaluations. For ease of reference, the negative effectiveness and performance metrics are reiterated herein: One of three COIs, 3 of the 17 MOEs, and only 8 of 49 MOPs were rated Somewhat Acceptable or less. (The few MOEs, without an explicit MOP, are in themselves MOPs as well.)

COI-1	**Effective Transport**	**Result**
MOP1-2-1	TACAN	Somewhat Acceptable
MOE1-8	GATM	Unsatisfactory

COI-2	**Effective Communications**	**Result**
MOP2-1-2	TARS Nonsecure Data Comm	Somewhat Acceptable
MOP2-2-2	SARS Nonsecure Data Comm	Completely Unacceptable
MOP2-3-2	UHF-Sat Nonsecure Data Comm	Somewhat Acceptable

COI-3	**Suitable Readiness**	**Result**
MOE3-1	Operational Availability	Unsatisfactory
MOP3-1-1	Departure Reliability Rate	Did Not Meet ORD Criteria
MOP3-1-2	Mission Capable (MC) Rate & FMC	Did Not Meet ORD Criteria
MOE3-2	System Reliability	Unsatisfactory
MOP3-2-1	Mean Time Between Critical Failures	Unsatisfactory

a. TACAN. This deficiency was based upon an expressed desire by a single pilot to display TACAN headings on the standby instruments and under all flight modes of the FMS. The TACAN information *is* available for display in all flight management system (FMS) navigation modes; apparently this was not briefed properly to the pilots flying the QOT&E missions. The crews were not aware of the capabilities to display the TACAN info on the PFD (Primary Flight Display). According to Maj Stubblefield, Pilot/Manager of the 99th, there is no need to provide TACAN to the standby horizontal situation indicator (HSI). Engineering concurs that the situation when this would be used is a very remote possibility involving the failure of multiple electrical backup systems. As the Final Report expressed, 'the TACANs current display configuration is adequate for mission accomplishment.' The TACAN displays are fully integrated with the FMS. These issues related to this MOP are considered **closed**.

b. GATM. Among all the business jets made in the world, the G-V is the closest to addressing all of the GATM or CNS/ATM functionality requirements. The only operational deficiency, emphasized in the QOT&E report, is the lack of RVSM (see paragraph 3.a. above). However, the aircraft is designed for optimal cruising above 41,000 feet MSL. RVSM will not be expanded to FL410 until the 2002 time frame or beyond. Therefore, with proper departure scheduling, taking into account the RVSM staging, no operational impacts are of immediate significance. Also, full RVSM certification is anticipated by March 2000. This issue is considered **closed**.

c. TARS Nonsecure Data Comm. See paragraph 3.b. above. This issue is considered **closed**.

d. SARS Nonsecure Data Comm. See paragraph 3.b. above. This issue is considered **closed**.

e. UHF-SatCom Nonsecure Data Comm. This is also an infrastructure issue and is being addressed at the DISA EMB SLTCS-OWG level. The Mobility System Program Office (SPO) Director Of Engineering, Mr. Forest Oberschlake, and the Commercial Aircraft IPT Chief Systems Engineer, Mr. James Warren, as members of the group, are representing SPO interests in this ongoing matter. This issue is considered **closed**.

f. Operational Availability. The G-V fleet, both Public and Private aircraft, have experienced a number of infant mortality issues invariably encountered with a new aircraft design. The top 10 problem components are identified by Gulfstream Maintainence, in the Gulfstream V Dispatch Critical Component List. These parts and components problems are analyzed and discussed with the respective suppliers in an on-going product improvement process lead by Mr. Jim Dempsey at Gulfstream. These efforts, in conjunction with Field Service Reps efforts at the Andrews COMBS, have brought the readiness metrics almost up to the extremely high objectives set by the C-37A ORD. This issue is considered **closed**.

g. Departure Reliability Rate. By 1 May 1999, the ORD requirement of 95% had been exceeded. The current rate is 96% and improvements are still anticipated. This issue is considered **closed**.

h. MC & FMC. As of the beginning of May 1999, the Mission Capable Rate of the C-37A fleet is 89.1%. This is just under the 90% requirement specified by the ORD. The Fully MC Rate is 72.5%, which is below the 85% minimum. This includes all activity since initial deployment, but the monthly rates since the first Maintenance Warranty Inspection (MWI) have exceeded all objectives. Keeping in mind the fleet is only two aircraft, we expect this to not be an issue much longer. This issue will remain **open** until December 1999; at which time we will review again.

i. System Reliability and Mean Time Between Critical Failures (MTBCF). There is no requirement to meet any MTBCF or related metrics specified in any of the acquisition guidance documents. Neither the 89th AW, HQ AMC, nor OC-ALC/LK tracks this metric. This, of course, includes all infant mortalities and noncritical, non-MOP, non-MEL failures. This number can not be used directly to deduce mission impacts or sortie impacts as was done in the QOT&E Report. Failures often occur in groups, and are addressed in field level maintenance in groups. In the tracking and forecasting of commercial derivative aircraft, the 89th uses PMC as the measure of system reliability. This issue is considered **closed**

5. Based on the actions taken to correct concerns with the effectiveness and suitability of the C-37A for the SAM mission, we feel the aircraft is indeed suitable for worldwide mission support. With the exception of the open items noted above, we have no plans at this time for any follow-on OT&E. Any questions or comments regarding this memorandum can be addressed to the C-37A Program Manager, Mr. Jim Reveal, at DSN 986-9484.

ALAN W. SCHOOLCRAFT
Colonel, USAF
C-32/C-37/CINC Systems Program Director

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Deficiency Report

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Attachment

DR Rank	Category	Priority	Deficiency	Status	Detail
1	II	1	RVSM certification	**Open**	Implement ASC as soon as FAA certification available
2	II	1	Service bulletin inspections	Closed	Interim extensions tripling time requirements implemented
3	II	1	Aircraft hydraulic system	Closed	The new --7 pumps were installed, GAC will soon release dual pump ASC
4	II	1	Passenger oxygen system	Closed	Problems with leaks has been identified and fixed
5	II	1	Engine oil quantity indicator & replenisher system	Closed	ASC42 now installed, correcting the problem
6	II	1	FMS weight and balance calculations	Closed	Corrected at the first Maintenance Warranty Inspection
7	II	1	Maintenance manuals	Closed	Updated and conformed to an appropriate initial release
8	II	1	CSO workstation user's guide & checklist	Closed	Publication now finished by GAC and distributed to CSOs
9	II	1	IPSS cabin user's guide	Closed	Was published before QOT&E, now widely distributed
10	II	1	Portable tow bar	Closed	New 48" towbar extensions purchased
11	II	2	Cabin air temperature	Closed	ASC85 now addresses this deficiency
12	II	2	Passenger air conditioning gaspers	Closed	ASC85 now addresses this deficiency
13	II	2	Approach plate holders	Closed	New holders installed for DoD sized plates
14	II	2	Convection oven configuration	Closed	Oven now installed IAW spec
15	II	2	Data transfer (e-mail) via SARS	**Open**	INMARSAT-COMSAT plan on upgrading bandwidth
16	II	2	Pilots' footwell areas cold	Closed	ASC85 now addresses this deficiency
17	II	2	Main lavatory sink drain	Closed	Problem was repaired with one-time maintenance action
18	II	2	FMS aircraft performance calculations	Closed	ASC73A now addresses this deficiency
19	II	3	Stowable cabin tables	**Open**	ACQ42 -> GAC too overloaded to address this year
20	II	3	Preset frequency placard for UHF radio	Closed	89th will apply a placard (TBD FSA/FAA Approval)?
21	II	3	Airshow (remote control) operations	Closed	Problem was repaired with one time maintenance action
22	II	3	Visible area of galley counter tops	Closed	Not a problem for most heights. Volume more critical
23	II	3	CSO armrest storage compartment access	Closed	Rehinged to open inward?
24	II	3	Viewing safe combination window	Closed	Too expensive to change, & must be hard mounted to floor
25	II	4	Navigation radios available to the standby HSI	Closed	99th Management does not see a need for the modification
26	II	4	TACAN display through the FMS	Closed	Capability is there, pilots are now informed on usage
27	II	4	Access to main lavatory	Closed	Aft lav door rehinged
28	II	4	Access to crew lavatory	Closed	Door stop was installed inadvertently
29	II	4	Flight station storage space	Closed	99th Management does not see a need for the modification
30	II	4	In-cabin storage space	Closed	Limited storage space was a pre-coordinated constraint vacuum lavs

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Jim Reveal
DTIC Point of Contact

8/18/99
Date